

REMARKS

Claims 258 has been amended. The limitation of claim 260 has been brought into claim 258 and claim 260 has been canceled. Claims 290-298 have been added. Support is found in the specification as filed. No new matter has been added. The Office Action is discussed in detail below.

Paragraph 3 of Office Action**Claim Rejections-35 USC 102**

Claims 258-259 and 261-268, and 276-277 are rejected under 35 USC 102(e) as being anticipated by Harshfield (US 6,031,287).

Independent claim 258 has been amended to recite:

258. A memory element, comprising:

a first dielectric material having an opening, said opening having a sidewall surface and a bottom surface;
a conductive material lining the sidewall surface of said opening, said conductive material formed over a portion of the bottom surface of said opening, said portion being less than the entire bottom surface;

a second dielectric material formed over said conductive material within said opening; and

a programmable resistance material electrically coupled to a top surface of said conductive material, said top surface having a lateral dimension less than 1000 Angstroms.

Harshfield does not disclose the limitation: "...said conductive material formed over a portion of the bottom surface of said opening, said portion being less than the entire bottom surface..." See also, Office Action 12/29/05, page 4, third paragraph.

Hence, the rejection of 258-259, 261-268, and 276-277 under 35 USC 102(e) as being anticipated by Harshfield (US

6,031,287) is overcome and applicant requests that the rejection be removed.

Claim Rejections - 35 USC 103

Claims 260, 278-289 are rejected under 35 USC 103(a) as being unpatentable over Harshfield (US 6,031,287) in view of Fukumoto (US 6,307,264).

Harshfield is directed to a contact structure for use in a chalcogenide memory element. The contact structure is used to provide an electrical signal to the chalcogenide memory material. Harshfield fails to teach or suggest a contact structure formed on only a portion of the bottom surface of an opening. In particular, Harshfield fails to teach or suggest the limitation of applicant's claims 260 and 278: *"...said conductive material formed over a portion of the bottom surface of said opening, said portion being less than the entire bottom surface..."*

Fukumoto is directed to a light reflection electrode. Figure 13k shows light reflection electrode 56. Light reflection electrode 56 reflects light that is introduced to the electrode. Polish stop 52 (shown in Figure 13k) is used to prevent dishing of the light reflection electrode (thinning in the center of the electrode). By reducing dishing of electrode 56, the light introduced to electrode 56 is reflected in the same direction to result in improved brightness and improved contrast of a reflection type liquid crystal display. see Fukumoto column 6, lines 51-54.

For references to be properly combined, there must be some suggestion or motivation to combine reference teachings. As noted, Harshfield is directed to a contact structure for a chalcogenide memory element. The contact structure provides an electrical signal to the chalcogenide memory material.

Harshfield provides no teaching or suggestion of a contact structure formed on only a portion of the bottom surface of an opening. In addition, Harshfield provides no teaching or suggestion that reducing the dishing in a contact structure is desirable for the contact structure of a chalcogenide memory element.

Fukumoto is directed to an electrode structure for a light reflecting electrode. Fukumoto teaching that reduced dishing is a desirable feature of a light reflecting electrode so as to aid in the reflection of light. Fukumoto provides no teaching or suggestion that the same electrode structure (with reduced dishing) is desirable for electrodes used for providing an electrical signal to a memory material. In particular, Fukumoto provides no teaching or suggestion that the same electrode structure may be used in combination with a chalcogenide memory material to form a chalcogenide memory element.

Hence, the Office Action attempts to combine a first reference, Harshfield, directed to contact structures used for providing electrical signals to a chalcogenide memory material with a second reference, Fukumoto, directed to electrodes used for reflecting light. The combination of Harshfield and Fukumoto is an improper combination.

In addition, it is particularly noted that the lateral dimension of Fukumoto's electrode structure is limited by lithographic constraints and cannot possibly be less than 1000 Angstroms. For example, referring to Figure 8E of Fukumoto, the shortest lateral distance between dielectric 20 and dielectric island 8 (which defines the lateral thickness of the conductive material 5) is limited by the lithographic feature size. The lithographic feature size at the time that Fukumoto was filed in the United States was well over 1000 Angstroms. Hence, it is not possible that the lateral dimension of the conductive material 5 (as shown in Figure 8E) be less than 1000 Angstroms. Moreover, Fukumoto provides

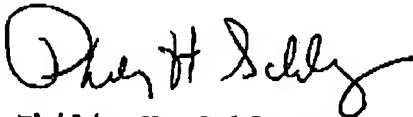
no teaching or suggestion of making a structure such as the one shown in Figure 8E having a sub-lithographic lateral dimension.

In view of the above remarks, the rejection of applicant's claims 260, 278-289 under 35 USC 103(a) as being unpatentable over Marshfield in view of Fukumoto is improper and applicant requests it be removed.

SUMMARY

Claims 258 has been amended. In view of the amendment to claim 258 and the above remarks, the claims 258, 259, 261-268 and 276-298 are in condition for allowance. Applicant respectfully requests reconsideration, withdrawal of the outstanding rejections, and notifications of allowance. Should the Examiner have any questions or suggestions regarding the prosecution of this application, he is asked to contact applicant's representative at the telephone number listed below.

Respectfully submitted,



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